

IN THE CLAIMS

This listing of the claim will replace all prior versions and listings of claim in the present application.

Listing of Claims

1. (currently amended) A packet transfer apparatus connected between a communication network and a plurality of base stations for conducting each of which conducts communications with a plurality of mobile stations via radio channels ~~and a communication network~~, for transferring packets received from said communication network to ~~a one of said a-base stations~~ station accommodating a plurality of destination mobile stations ~~station~~ of the received packets, comprising:

storing means for storing packets received from said communication network correlating the packets with each of the destination mobile stations;

receiving means for receiving a control message from each of said base stations periodically, the control message being ~~generated according to a~~ including transfer rate information ~~rate of~~ packet transmission between the base station and each one of mobile stations under control of the base station; and

control means for reading out packets destined for ~~a specific mobile stations~~ from said storing means in accordance with the contents of the control message received by said receiving means and transmitting the packets to the base station to which the specific mobile stations are ~~is~~ connected.

2. (original) The packet transfer apparatus according to claim 1, wherein said storing means stores packets received from said communication network correlating the packets with a group of mobile stations.

3. (currently amended) The packet transfer apparatus according to claim 1, wherein said receiving means comprises:

a transmission and reception control unit connected to said base station; and
a base station session management unit for extracting said transfer rate information of each mobile station from said control message received by said receiving means.

4. (original) The packet transfer apparatus according to claim 1, wherein said control means has a base station session management unit for reading out packets destined for a specific mobile station indicated by said control message from said storing means and transmitting the packets to the base station to which the specific mobile station is connected at a transfer rate designated by said control message.

5. (currently amended) A packet transfer apparatus connected between a communication network and a plurality of base stations for conducting each of which conducts communications with a plurality of mobile stations via radio channels ~~and a communication network~~, for selectively transferring packets received from said

communication network to one of said base stations accommodating a destination mobile station ~~stations~~ of the received packet ~~packets~~, comprising:

storing means for storing packets received from said communication network correlating the packets with each of the destination mobile station;

receiving means for receiving a control message from each of said base stations periodically, said a control message being indicative of a rate of packet transmission between the base station and a mobile station for each of mobile stations under control of the base station; and

control means for calculating a total value of packet transfer rates of a plurality of mobile stations under control for each base station from the control message received by said receiving means, when the total value of the packet transfer rates exceeds an upper limit value of the rate of data transfer between the packet transfer apparatus and the base station, decreasing the packet transfer rates of said plurality of mobile stations at a predetermined ratio, reading out packets destined for said mobile stations from said storing means in accordance with the decreased packet transfer rates, and transmitting the packets to the base station to which the mobile stations are connected.

6. (currently amended) A base station for conducting communication with a plurality of mobile stations via radio channels, the base station constructing a wireless communication system together with a packet transfer apparatus connected to a communication network, comprising:

a receiving unit for receiving information which designates a forward link transmission rate from each of mobile stations under control;

a controller for periodically generating a flow control message for designating a rate of packet transfer from said packet transfer apparatus to the base station in accordance with the forward link transmission rate designated by each of said mobile stations, and transmitting the generated message to said packet transmission apparatus;

a buffer memory for storing packets destined for said mobile stations, which are received from said packet transfer apparatus; and

a transmitter for reading out the packets stored in said buffer memory in accordance with the forward link transmission rate designated by the destination mobile station thereof, and transmitting the packets to a radio channel corresponding to the destination mobile station.

7. (currently amended) A wireless communication system comprising a plurality of base stations each for performing communication with a plurality of mobile stations in their control areas via radio channels, and a packet transfer apparatus connected between said plurality of base stations and a communication network,

wherein each of said base stations has means for receiving from each of mobile stations in the control area a notification of a transmission rate, ~~which is calculated based on the basis of a signal received from the base station, from each of mobile stations in the control area,~~ and means for periodically generating a control

message for designating a packet transfer rate for each mobile station, and transmitting the control message to said packet transfer apparatus, and

said packet transfer apparatus has means for storing packets received from said communication network for each destination mobile station, and selectively transferring the ~~packet~~packets to each of said base stations at a packet transfer rate peculiar to the destination mobile station designated by said ~~the~~ control message.

8. (currently amended) The wireless communication system according to claim 7,

wherein each of said base stations has means for transmitting a notification message to said packet transfer apparatus when handover of a mobile station occurs from one of neighboring base stations to the base station, the message indicating that said mobile station has moved in the control area of the base station, and

said packet transfer apparatus has means for interrupting transfer of a ~~packet~~packets destined for said mobile station to said neighboring base station in response to said notification message, and starting transfer of the packet destined for said ~~the~~ mobile station to the base station to which said ~~the~~ mobile station is handed over when a control message for designating a packet transfer rate is received from the base station.

9. (currently amended) A packet transfer apparatus connected between a communication network and a plurality of base stations for performing each of each

~~conducts~~ communication with a plurality of mobile stations via radio channels ~~and a communication network~~, for transferring ~~a packet~~packets destined for a specific mobile station ~~stations~~ received from said communication network to a base station accommodating said specific mobile station~~stations~~, comprising:

means for grouping a plurality of mobile stations under control of ~~each of said~~ base stations into a plurality of rate classes for each base station in accordance with transmission rates of the radio channels ~~for each base station~~of said mobile stations;

storing means for storing packets received from said communication network ~~correlating the packets~~into buffer areas correlated to said rate classes, in accordance with the group-rate class of the destination mobile station ~~station of~~ each of the received packets;

receiving means for receiving, from each of said base stations, control messages each generated periodically according to the rate of packet transfer between the base station and mobile stations belonging to one of said rate classes under control of the base station, each of said control message indicating a window size in association with each of rate classes; and

control means for reading out packets of a specific group-rate class from said ~~storing means~~buffer areas in accordance with the ~~contents of~~window size indicated in the control message received by said receiving means and transmitting the packets to the base station accommodating the destination mobile station of the packets.

10. (original) A wireless communication system comprising a plurality of base stations for performing communication with a plurality of mobile stations via radio channels, and a packet transfer apparatus connected between said plurality of base stations and a communication network,

wherein each of said base stations comprises:

a buffer memory divided in a plurality of rate class areas according to data transmission rates in a forward link radio channels between mobile stations under control and the base station;

means for generating a control message for instructing a transfer amount of packets from said packet transfer apparatus to the base station at each rate class in accordance with a free space in each of the rate class areas in said buffer memory and transmitting the control message to said packet transfer apparatus;

means for storing a packet received from said packet transfer apparatus into a rate class area corresponding to the destination mobile station of said received packet in said buffer memory; and

means for reading out packets at a rate corresponding to a rate class from each of the rate class areas in said buffer memory and transmitting the packet to the destination mobile station, and

said packet transfer apparatus comprises:

means for grouping packets received from said communication network into rate classes according to data transmission rates of destination mobile stations and buffering the packets; and

means for reading out said buffered packets in accordance with a transfer amount of each rate class indicated by the control message received from each of said base stations and transmitting the packet to the base station corresponding to the destination mobile station of the packet.